

REMARKS

Claims 1-10 are pending in the present Application. Claims 2 and 3 have been canceled, Claims 1 and 4 have been amended, and Claims 6-10 have been withdrawn, leaving Claims 1, 4, and 5 for consideration upon entry of the present Amendment.

Claim 1 has been amended to include that the surface includes silanol groups, and that the silanols of Formulas 1 and 2 are simultaneously deposited. Support for these amendments can be found in the Specification at least on p. 6, lines 11-12, and in original Claims 2 and 3. Accordingly, Claims 2 and 3 are canceled upon entry of the present amendment.

Claim 4 has been amended to recite the temperature scale in degrees centigrade. Support for this amendment can be found in the Specification at least on p. 5, lines 11-12.

No new matter has been introduced by these amendments. Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

Claim Rejections Under 35 U.S.C. § 112, Second Paragraph

Claim 4 stands rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Examiner states that no temperature scale is claimed, and since the specification discloses 60-140°C, it should be so clarified in the claims. Accordingly, the claim has been amended to recite temperature in degrees centigrade.

Applicants wish to note that the omission of “ °C ” from Claim 4 is an inadvertent typographical error attributable to the use of the incorrect font for this character. Accordingly, no new matter has been introduced by this amendment. Reconsideration and allowance are respectfully requested.

Claim Rejections Under 35 U.S.C. § 102(b)

Claims 1, 4, and 5 stand rejected under 35 U.S.C. § 102(b), as allegedly anticipated by U.S. Patent No. 6,277,480 (“Veerasamy”). Applicants respectfully traverse this rejection.

Veerasamy discloses coating a fluoroalkyl silane (“FAS”) layer on a substrate, and

teaches specific examples of FAS compounds. Col. 8, lines 42-59. Veerasamy teaches vapor deposition at 70°C, and that the substrate may be silicon or glass. Col. 16, line 64 to Col 17, line 1; Col. 1, lines 13-18 and Col. 16, lines 25-26.

To anticipate a claim, a reference must disclose each and every element of the claim. *Lewmar Marine v. Varient Inc.*, 3 U.S.P.Q.2d 1766 (Fed. Cir. 1987).

Applicants note that Veerasamy is silent as to the sequence of deposition of FAS compounds, and does not specify a method of applying, as is claimed in dependent claims 2 and 3 of the present invention. Col. 8, lines 63-67. Further, and as acknowledged by the Examiner in the present Office Action dated 10/16/06 on p. 5, Veerasamy does not anticipate claims 2 or 3, and therefore inclusion of the limitation of these claims as provided in instant Claim 1 as amended would overcome the anticipatory rejection of Claim 1 and its dependents. Accordingly, Veerasamy does not anticipate Claim 1 as amended.

In addition, regarding the rejection of instant Claim 5, Veerasamy discloses a multilayer structure in which an antireflective layer 2 is deposited on substrate 1, a diamond-like carbon (DLC) inclusive layer 3 is deposited on layer 2, an optional organosilicon or inorganic oxide (e.g., silicon oxide) primer layer 4 is deposited on DLC inclusive layer 3, and an optional FAS layer 6 is deposited over layer 3 or 4 where used. Col. 2, lines 46-56; Col. 5, line 34-65; Col. 8, lines 6-13. The primer layer 4 or DLC inclusive layer 3 are believed to have “highly reactive dangling bonds” and treatment of the DLC with FAS compounds enables tight binding of the FAS layer 6 onto the primer layer 4. Col. 8, lines 23-30. Applicants further note that Veerasamy discloses a glass substrate but not a silicon substrate. Col. 1, lines 18-20. Thus, Veerasamy discloses treatment of the surface of either a diamond like carbon (DLC) layer or an organosilicon primer layer with a FAS compound, but fails to disclose treatment of a substrate surface having silanol groups and the order of deposition, and specifically fails to disclose or teach the treatment of a silicon or glass substrate, as claimed in the instant Claim 5; or for that matter, fails to disclose or teach treatment of the silicon or glass substrate in Veerasamy absent the DLC or DLC/primer layers.

In order to anticipate, a piece of prior art must clearly and unequivocally disclose the claimed composition or direct those skilled in the art to the composition without any need for

picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference. *In re Arkley*, 59 CCPA 804, 455 F.2d 586, *Air Products & Chemicals, Inc. v. Chas. S. Tanner Co.* 219 USPQ 223, *Perricone v. Medicis Pharmaceutical Corp.* 267 F.Supp.2d 229. The instant specification does not disclose treatment of DLC nor organosiloxane or other primers. Further, neither a DLC layer or an organosilicon or other primer are identical to a silicon substrate as claimed, or the glass substrate as disclosed in Veerasamy and as disclosed in the instant Specification, and therefore treatment of these DLC or organosiloxane layers cannot anticipate the present invention.

Thus, for at least the above reasons, Veerasamy does not disclose treating a silanol surface of the invention with a fluorosiloxane, as disclosed in the Specification of the present invention on p. 1, lines 26-31 and in Examples 1 and 2, and as claimed in amended Claim 1, and therefore, Veerasamy does not anticipate Claim 1 or its dependents. Reconsideration and allowance are therefore respectfully requested.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 2 and 3 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Veerasamy. Applicants respectfully traverse this rejection. As the limitations of Claims 2 and 3 have been included in instant Claim 1, Applicants will regard the rejection of Claims 2 and 3 herein as a rejection of Claim 1 for the purposes of simplicity.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

The Examiner states that Veerasamy does not specify whether the combination so FAS compounds are deposited sequentially or simultaneously, it would have been obvious to mix the compounds in the absence of unexpected results resulting from sequential or simultaneous deposition. Applicants disagree, and as discussed above, note that Veerasamy is silent as to the sequence of deposition of FAS compounds, and does not specify a method of applying, as is claimed in dependent claims 2 and 3 of the present invention. Col. 8, lines 63-67. As already discussed hereinabove, Veerasamy thus fails to disclose all elements of the instant claims, and therefore does not make the amended instant Claim 1 unpatentable.

The Examiner states in effect that the order of addition of silane treatment agents in the present invention is mere optimization. Applicants disagree, and note the results of Example 1 in which the use of a two-step deposition process of a nonfluorinated alkoxysilane and a fluorinated alkoxysilane provided a high PCR conversion rate comparable to the control performance target of 40 nanograms per microliter, when compared with Comparative Example 1 which was primarily treated with a fluorinated alkoxysilane (and hence is comparable to the use of a two step process in which the fluorinated alkoxysilane is deposited first). One skilled in the art will thus appreciate that order of deposition in the preparation of a substrate can affect the distribution and relative hydrophobicity of the resulting treated surface, and thus is a description of a level of control over the hydrophobicity of the treated surface for which an effect can be observed in the use of the substrate. *In re Laskowski*, 871 F.2d 115, 117, 10 U.S.P.Q.2d 1397, 1398 (Fed. Cir. 1989) (“Although the Commissioner suggests that [the structure in the primary art reference] could readily be modified to form the [claimed] structure, ‘[t]he mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification’”) (citation omitted); *In re Stencel*, 828 F.2d 751, 755, 4 U.S.P.Q.2d 1071, 1073 (Fed. Cir. 1987) (obviousness cannot be established “by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion that the combination be made”). There is no teaching or suggestions to combine elements of the prior art to produce the foregoing effects found with the treated surface of Claim 1. Thus, the present invention is thus nonobvious.

In addition, and as described hereinabove, Veerasamy discloses treatment of the surface of either a diamond like carbon (DLC) layer or an organosilicon or metal oxide primer layer with a FAS compound, but fails to disclose treatment of a substrate surface having silanol groups and the order of deposition, and specifically fails to disclose or teach the treatment of a silicon or glass substrate (as claimed in the instant Claim 5). Veerasamy discloses that the primer layer is only provided to improve bonding between the DLC layer and the FAS, but does not disclose treating a substrate such as silicon or glass with the FAS compound or that doing so would provide a result equivalent to that obtained by the invention of instant Claim 1 or its dependents. Col. 5, lines 34-37. Thus, Veerasamy does not teach or disclose the treated substrate (silicon or glass) as claimed at least in Claim 5, or that the invention of Veerasamy would provide a reasonable expectation for success absent the DLC or DLC/primer layers of Veerasamy. Thus, Veerasamy fails to provide a suggestion or motivation to modify Veerasamy to provide the invention of instant Claims 1 or 5, and does not make the claims unpatentable.

Thus, for at least the above reasons, Veerasamy does not disclose treating a silanol surface of the invention with a fluorosiloxane, as disclosed in the Specification and as claimed in amended Claim 1, does not disclose the use of any order of treatment of the substrate, and does not provide a reasonable expectation for success if the modification to Veerasamy were made. Therefore, Veerasamy does not render Claim 1 or its dependents unpatentable. Reconsideration and allowance are therefore respectfully requested.

Claims 1-5 are rejected under 35 U.S.C. § 103(a) as unpatentable over Hozumi et. al., *Langmuir*, **1999**, 15(22), 7600-7604 (“Hozumi”). Applicants respectfully traverse this rejection.

Hozumi teaches a method of treating a surface of a substrate used in a biochemical reaction system with an FAS compound; vapor deposition at 100°C; and a silicon substrate. See p. 7600, Col. 2 to p. 7601, Col. 1; e.g., Col 16, line 64 to Col. 17, line 1; and p. 7600, Col 1.

The Examiner acknowledges that Hozumi teaches deposition of one FAS compound,

but does not disclose a combination of FAS compounds. See p. 7601, Col. 2. The Examiner states that it would have been obvious to coat a substrate sequentially or simultaneously. Applicants respectfully disagree, and refer to the above discussion of unexpected results described in a comparison of the results of Example 1 (having a surface treated in a sequential process with an alkyl and fluoroalkyl alkoxysilane) with that of Comparative Example 1 (having only a single fluoroalkyl alkoxysilane as a surface treatment). Hozumi thus fails to teach all elements of the instant claims, and fails to provide a suggestion or incentive for modifying the disclosure of Hozumi to arrive at the invention of the instant claims, and further fails to provide a reasonable expectation for success (based on the poor results of Comparative Example 1 relative to the unexpectedly good results embodied in Example 1 of the instant Specification).

Thus, for at least the above reasons, Hozumi does not make the amended instant Claim 1 or its dependents unpatentable. Reconsideration and allowance are therefore respectfully requested.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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